Remarks

Upon entry of the foregoing amendment, claims 2 and 13-17 are pending in the application, with claims 2 and 15 being the independent claims. Claims 1 and 3-12 were previously cancelled. New claims 15-17 are sought to be added.

Support for new claims 15-17 can be found in the originally filed claims and specification. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

I. Rejection under 35 U.S.C. § 112, First Paragraph

Claims 2, 13 and 14 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly for failing to comply with the enablement requirement. Applicants respectfully traverse the rejection.

According to the Examiner:

> Claims 2, 13-14 while being enabling for a composition comprises a mixture of active compounds: thiodicarb and imidacloprid, the mixture does not reasonably provide enablement for synergistic activity.

(Office Action, page 3) (emphasis in original). Applicants respectfully disagree.

However, solely to expedite the prosecution of this application and not in acquiescence to the Examiner's rejection, claim 2 has been amended to remove the language "synergistically effective." Accordingly, this rejection is moot.

II. Rejection under 35 U.S.C. § 103(a)

Claims 2, 13 and 14 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Treacy *et al.* (EP 1198170 B1) ("Treacy") in view Uhr *et al.* (U.S. Patent No. 6,828,275) ("Uhr"). Applicants respectfully traverse this rejection.

A. Prima Facie Case of Obviousness Has Not Been Established

The present claims 2, 13 and 14 are directed to a composition comprising a mixture of thiodicarb and imidacloprid. Each of claims 2, 13 and 14 also requires specific mixing ratios of thiodicarb to imidacloprid.

Treacy relates to "an insecticidal composition comprising *as essential active ingredients* a neuronal sodium channel antagonist of formula I in combination with one or more compounds selected from the group consisting of pyrethroids, pyrethroid-type compounds, recombinant nucleopolyhedroviruses capable of expressing an insect toxin, organophosphates, carbamates, formamidines, macrocyclic lactones, amidinohydrazones, GABA (gama-aminobutyric acid) antagonists and acetylcholine receptor ligands in synergistically active amounts." (Treacy, page 2, para. 4.) Carbamates include methomyl, thiodicarb, fenothiocarb, or the like, and acetylcholine receptor ligands include imidacloprid, acetamiprid, nitenpyram, thiamethoxam, or the like (*id.* at page 4, para. 17). Treacy discloses eight (8) combinations containing a specific neuronal sodium channel antagonist of formula Ia (compound A) and cypermethrin, amitraz, fipronil, acetamiprid, spinosad, thiodicarb, hydramethylnon or HzNPV-AalT. (*Id.* at pages 5-7, Tables I-III.) Thus, Treacy only discloses that carbamates (such as thiodicarb) and/or acetylcholine receptor ligands (such as imidacloprid) can be used as optional mixing partners for the *essential* active ingredients, *i.e.*, a neuronal sodium channel antagonist of

formula I. Treacy does not disclose or provide a reason for making a composition containing carbamates and acetylcholine receptor ligands without a neuronal sodium channel antagonist of formula I. In sum, Treacy does not disclose a composition comprising a mixture of thiodicarb and imidacloprid as recited in present claims 2, 13 and 14. Furthermore, as acknowledged by the Examiner, Treacy does not disclose the mixing ratios of thiodicarb to imidacloprid as recited in present claims 2, 13 and 14.

Uhr does not cure the deficiencies of Treacy. Uhr discloses synergistic insecticidal mixtures of fipronil and agonists or antagonists of nicotinic acetylchloline receptors of formula (I), one of which is imidacloprid. (Uhr, col. 1, lines 31-36; and col. 4, lines 25-29). Uhr also generally discloses that such mixtures can additionally contain other insecticides or fungicides (*see id.* at col. 9, line 64, through col. 13, line 62). Thiodicarb is listed as one of the numerous insecticides (*id.* at col. 10, line 18). Thus, Uhr only discloses that thiodicarb can be used as an optional mixing partner for the *required* ingredients fipronil and imidacloprid. Uhr does not disclose or provide a reason for making a composition containing imidacloprid and thiodicarb without fipronil. In sum, Uhr does not disclose a composition comprising a mixture of thiodicarb and imidacloprid as recited in present claims 2, 13 and 14. Furthermore, Uhr does not disclose the mixing ratios of thiodicarb to imidacloprid as recited in present claims 2, 13 and 14.

In rendering the rejection, the Examiner asserted that:

> It would have been obvious. . . to combine the teachings of Treacy et al. with Uhr et al. to arrive at the instant invention.
>
> One of ordinary skill would have been motivated to choose the desirable insecticide combination, i.e. thiodicarb and imidacloprid, and then adjusts the appropriate ratio of their amounts to its

> desirable level for controlling animal pests, depending on the type of pest one wishes to attain, as suggested by Treacy et al.
>
> One of ordinary skill also would have been motivated to further incorporate optional ingredients, i.e. extenders or surfactants, into the composition, dependent on the formulations one wishes to attain, as suggested by Uhr et al.
>
> .

(Office Action, page 9.) Applicants respectfully disagree.

Applicants are aware of the flexible approach for establishing obviousness set out in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). However, as cautioned by Judge Rader in a post-*KSR* decision in *In re Kubin*, 561 F.3d 1351 (Fed. Cir. 2009), "where a defendant merely throws metaphorical darts at a board filled with combinatorial prior art possibilities, courts should not succumb to hindsight claims of obviousness." (561 F.3d at 1359.) As discussed above, Treacy and Uhr do not disclose or provide a reason for making a composition containing thiodicarb and imidacloprid. In rendering the rejection, the Examiner picked and chose thiodicarb and imidacloprid by eliminating the essential mixing partners from each of the cited references: a neuronal sodium channel antagonist of formula I (Treacy) and fipronil (Uhr), respectively. The facts presented in Treacy and Uhr would not have led one of ordinary skill in the art to select imidacloprid and thiodicarb to arrive at presently claimed composition. Thus, Applicants contend that the Examiner merely selected thiodicarb and imidacloprid based on impermissible hindsight.

In summary, Treacy and Uhr, alone or in combination, do not disclose or provide a reason for making a composition comprising a mixture of thiodicarb and imidacloprid, nor the mixing ratios of thiodicarb to imidacloprid as recited in claims 2, 13 and 14.

Accordingly, for at least these reasons, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness of claims 2, 13 and 14.

For the same reasons discussed above, new claims 15-17 are not *prima facie* obvious over Treacy in view of Uhr.

B. The Evidence of Synergistic Effect Rebuts Any Prima facie Case of Obviousness

Even assuming, *arguendo*, that a *prima facie* case of obviousness had been established, which it has not, the synergistic effect exhibited by the claimed invention is sufficient to rebut any *prima facie* case of obviousness. Synergistic effect has long been recognized as an indicator of non-obviousness. *See In Re Luvisi*, 144 U.S.P.Q. 646, 651-653 (CCPA 1965); *In re Lemin*, 408 F.2d 1045, 1049 (CCPA,1969).

Applicants reiterate that for the explanations detailed in Applicants' Reply of June 22, 2009, the present invention possesses synergistic effect as shown in the specification.

In addition, Applicants submit herewith the Declaration of Heike Hungenberg under 37 C.F.R. § 1.132 ("the Declaration"), which provides further evidence of synergistic effect of the claimed invention. The pending claims are directed to a mixture of thiodicarb and imidacloprid. The Declaration also includes data obtained from other mixtures. For the purpose of this reply, Applicants will discuss the data related to the mixture of thiodicarb and imidacloprid in detail below.

(a) Methods of Demonstrating Synergism

The Board has recognized that there are many appropriate methods of demonstrating synergism. *Ex parte Quadranti*, 25 U.S.P.Q.2d 1071, 1072-1073 (1992) ("There are undoubtedly many appropriate methods of demonstrating synergism. In each

case, however, the facts shown must be analyzed to determine whether the method chosen in that case has in fact clearly and convincingly demonstrated the existence of synergism or, more generally speaking, an unobvious result."). Synergism is shown where "the combined action of two or more agents * * * that is greater than the sum of the action of one of the agents used alone * * * ." *In Re Luvisi*, 144 U.S.P.Q. 646, 652 (CCPA 1965). Synergism of a given composition containing two or more active insecticidal compounds can also be demonstrated by comparing the observed insecticidal activity of the composition to the calculated insecticidal activity according to the Colby formula. If the observed insecticidal activity is greater than that calculated, then the composition has a synergistic effect. (Specification at page 30, lines 8-21.)

(b) Myzus persicae Test

In this test, cabbage leaves that are infested by the green peach aphid (*Myzus persicae*) are treated with the preparations of the active compounds. The efficacy of insect control is evaluated after 1 day. (The Declaration, Example A and Table A.)

As shown in Table A, thiodicarb and imidacloprid, when applied individually at 4 and 0.8 ppm, respectively, have efficacies of 0% and 25%, respectively. However, an efficacy of 70% is observed when the claimed composition (4 ppm thiodicarb + 0.8 ppm imidacloprid, ratio 5:1) is applied. Thus, the efficacy (70%) of the claimed composition is *much greater than* the sum of the efficacy of applied individually (0% + 25% = 25%). Therefore, the claimed composition has a synergistic effect in controlling *Myzus persicae*, according to the definition of synergism in *In Re Luvisi*. Alternatively, according to Colby formula, the calculated efficacy of the claimed composition is 25%. However, the observed efficacy of the claimed composition was 70%, which is *much*

greater than the calculated efficacy. Therefore, the claimed composition has a synergistic effect in controlling *Myzus persicae*, according to Colby formula.

Similarly, as also shown in Table A, the claimed composition at a different thiodicarb to imidacloprid mixing ratio (0.8 ppm thiodicarb + 0.8 ppm imidacloprid, ratio 1:1) has a synergistic effect in controlling *Myzus persicae*, according to the definition of synergism in *In Re Luvisi* and according to Colby formula.

(c) Phaedon cochleariae Test

In this test, cabbage leaves are treated by the preparations of tested compounds and then infested with larvae of the mustard beetle (*Phaedon cochleariae*). The efficacy of insect control is evaluated after 1 day. (The Declaration, Example B and Table B1.)

As shown in Table B1, thiodicarb and imidacloprid, when applied individually at 100 ppm, have efficacies of 0% and 50%, respectively. However, an efficacy of 80% is observed when the claimed composition (100 ppm thiodicarb + 100 ppm imidacloprid, ratio 1:1) is applied. Thus, the efficacy (80%) of the claimed composition is *much greater than* the sum of the efficacy of applied individually (0% + 50% = 50%). Therefore, the claimed composition has a synergistic effect in controlling *Phaedon cochleariae*, according to the definition of synergism in *In Re Luvisi*. Alternatively, according to Colby formula, the calculated efficacy of the claimed composition is 50%. However, the observed efficacy of the claimed composition was 80%, which is *much greater than* the calculated efficacy. Therefore, the claimed composition has a synergistic effect in controlling *Phaedon cochleariae*, according to Colby formula.

Similarly, as also shown in Table B1, the claimed composition at a different thiodicarb to imidacloprid mixing ratio (20 ppm thiodicarb + 100 ppm imidacloprid, ratio

1:5) has a synergistic effect in controlling *Phaedon cochleariae*, according to the definition of synergism in *In Re Luvisi* and according to Colby formula.

(d) Plutella xylostella Test

In this test, cabbage leaves are treated by the preparations of tested compounds and then infested with larvae of the diamond back moth (*Plutella xylostella*). The efficacy of insect control is evaluated after 6 days. (The Declaration, Example C and Table C2.)

As shown in Table C2, thiodicarb and imidacloprid, when applied individually at 20 ppm, have efficacies of 30% and 0%, respectively. However, an efficacy of 50% is observed when the claimed composition (20 ppm thiodicarb + 20 ppm imidacloprid, ratio 1:1) is applied. Thus, the efficacy (50%) of the claimed composition is *much greater than* the sum of the efficacy of applied individually (30% + 0% = 30%). Therefore, the claimed composition has a synergistic effect in controlling *Plutella xylostella,* according to the definition of synergism in *In Re Luvisi*. Alternatively, according to Colby formula, the calculated efficacy of the claimed composition is 30%. However, the observed efficacy of the claimed composition was 50%, which is *much greater than* the calculated efficacy. Therefore, the claimed composition has a synergistic effect in controlling *Plutella xylostella*, according to Colby formula.

Similarly, as also shown in Table C2, the claimed composition at a different thiodicarb to imidacloprid mixing ratio (20 ppm thiodicarb + 100 ppm imidacloprid, ratio 1:5) has a synergistic effect in controlling *Plutella xylostella*, according to the definition of synergism in *In Re Luvisi* and according to Colby formula.

In summary, Applicants have provided further evidence of synergistic effect of the claimed invention at different mixing ratios and against different insects. Applicants respectfully request that the Examiner consider the evidence of synergistic effect presented in the specification and the Declaration, and that the rejection be withdrawn.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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